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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/963,727	09/26/2001	Shibin Jiang	NP-0010	9304

30343            7590            05/15/2003

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EXAMINER

PETKOVSEK, DANIEL J

ART UNIT

PAPER NUMBER

2874

DATE MAILED: 05/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	09/963,727	JIANG ET AL.	
Examiner	Daniel J Petkovsek	Art Unit	2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on \_\_\_\_\_.

2a) This action is **FINAL**.      2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-48 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) 11-41 is/are allowed.

6) Claim(s) 1-6 is/are rejected.

7) Claim(s) 7-10, and 42-48 is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on September 26, 2001 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some \* c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .

4) Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_

5) Notice of Informal Patent Application (PTO-152)

6) Other: *Brian Healy*

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The prior art documents submitted by Applicant in the Information Disclosure Statements filed on November 28, 2001, have been considered and made of record (note attached copy of forms PTO-1449).

### ***Claim Objections***

2. Claim 42 is objected to because of the following informalities: on line 19, a typo exists in where a 2 was left out in Tmc~~2~~-soft. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-3, and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Tian US Patent Application Publication 2002/0164132 A1.

US 2002/0164132 A1 to Tian teaches (ABS, [0009], [0030], Claims) a method and apparatus of fusing an optical fiber comprising: a first fiber formed from silica glass and a second fiber formed from a multi-component glass, the 2<sup>nd</sup> fiber having a lower softening point than the 1<sup>st</sup> fiber (see [0030]); asymmetrically heating the fibers to raise the temperature of the silica fiber higher than that of the multi-component fiber; and moving the fibers together to form

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thermal diffusion bonds during splicing, which clearly, fully meets Applicant's claimed limitations. Regarding claim 2, the heating element is a distance from the gap. Regarding claims 3 and 5, see [0009] for reference to an arc for the heating source, and heating by conduction of the 1<sup>st</sup> fiber to the 2<sup>nd</sup>.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tian US Patent Application Publication 2002/0164132 A1.

US 2002/0164132 A1 to Tian teaches (ABS, [0009], [0030], Claims) a method and apparatus of fusing an optical fiber comprising: a first fiber formed from silica glass and a second fiber formed from a multi-component glass, the 2<sup>nd</sup> fiber having a lower softening point than the 1<sup>st</sup> fiber (see [0030]); asymmetrically heating the fibers to raise the temperature of the silica fiber higher than that of the multi-component fiber; and moving the fibers together to form thermal diffusion bonds during splicing. Tian '132 does not explicitly teach that the heating element consists of a heating filament that lies at least partially around the first fiber, and does not explicitly teach that the bond between the fibers has a pull-strength in excess of 100g.

Regarding claim 4, Tian '132 and related art (see [0009]) teach heating the fiber at a point displaced from the fiber ends. The fibers are to be heated by an arc, or another heat source.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use another heat source, such as a filament at least partially around the 1<sup>st</sup> fiber, for the motivation of a more evenly distributed heating function. A fully surrounded heating filament on a fiber would heat the fiber more uniformly.

Regarding claim 6, it would have been obvious at the time the invention was made to a person having ordinary skill in the art that the spliced optical fibers as shown in Tian '132 would have been designed to maintain a high pull-strength ratio. Although the pull-strength ratio is not explicitly discussed, ranges of 100g are not uncommon in the art. It is the responsibility of Applicant to prove that the claimed invention overcomes the prior art in this area.

*Allowable Subject Matter*

7. Claims 11-41 are allowed. The relevant prior art does not teach or reasonably suggest a method of fusion splicing of optical fibers, in that a first fiber is formed of a silica glass and a second fiber is formed comprising a core with a first multi-component glass, and an outer cladding with a second multi-component glass, the second multi-component glass having a softening point higher (and being more compatible for forming thermal bonds with silica glass) than the first multi-component glass. The method includes generating heat so the second fiber softens, but the first silica fiber does not soften, and a thermal diffusion bond develops between the first fiber and the second fiber's outer cladding. Regarding claims 38-41, the prior art does not teach or reasonably disclose a method of drawing a multi-component fiber that is compatible with fusion splicing in which the properties of the second fiber exist as stated above.

8. Claims 42-48 are objected to as having minor informalities, but would be allowable if the informalities of claim 42 were to be corrected. The claims are allowable for the same reasons as given above, with particular reference to the second fiber with two multi-component layers for adjoining the silica fiber to the cladding of the second fiber.

9. Claims 7-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The relevant art does not teach or reasonably suggest the percentages of the multi-component glass in claim 7, or the restrictions of the second multi-component fiber in claims 8-10.

### *Conclusion*

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, with respect to the state of the art of fusion splicing different fibers:

U.S.P. No. 5,251,062 to Snitzer et al. (ABS, Fig. 1, column 3 lines 1-15)

U.S.P. No. 4,008,344 to Okamoto et al. (ABS)

US 2003/0081915A1 to Fajardo et al. (asymmetrical heating)

JP 63-105118 to Suzuki et al. (see abstract)

JP 11-287922 to Fujiura et al. (see abstract for asymmetrical heating, fusion splicing)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J Petkovsek whose telephone number is (703) 305-6919. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (703) 308-4819. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 872-9321.

*DPP*  
Daniel Petkovsek  
May 9, 2003

*Brian Healy*  
Brian Healy  
Primary Examiner